Notice of Allowability	Application No.	Applicant(s)	
	10/580,491	VESTWEBER ET AL.	
	Examiner	Art Unit	
	GREGORY CLARK	1786	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *04/06/2011*.

2. ☒ The allowed claim(s) is/are *1-4,7-10,12-22 and 24-30*.

3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☒ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☒ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☒ Other *Interview Summary/ Paper No. 20110412*.

/GREGORY CLARK/ Examiner, Art Unit 1786	/D. Lawrence Tarazano/ Supervisory Patent Examiner, Art Unit 1781

DETAILED ACTION

The examiner acknowledges the receipt of applicants' amended claims dated 04/06/2011.

Finality is withdrawn based on applicants' amendment to claim 22.

Allowable Subject Matter

1. The following is an examiner's statement of reasons for allowance: applicant claims

Organic electroluminescent device comprising an anode, a cathode and an emission layer, consisting of at least one matrix material which is doped with at least one phosphorescent emitter, characterised in that a hole-blocking layer which comprises a compound of the formula (1)

(Formula 1)

where the following applies to the symbols and indices used:

Q is on each occurrence, identically or differently, N or CR, with the proviso that at least two and a maximum of four Q stand for nitrogen;

R is on each occurrence, identically or differently, H, NO_2, CN, $N(R^1)_2$, a straight-chain, branched or cyclic alkyl or alkoxy group having 1 to 40 C atoms, in which one or more non-adjacent CH_2 groups may be replaced by $-R^1C=CR^1-$, $-C\equiv C-$, $Si(R^1)_2$, $Ge(R^1)_2$, $Sn(R^1)_2$, -O-, -S- or $-NR^1-$ and in which one or more H atoms may be replaced by F or an aromatic group R^1, or
an aromatic or heteroaromatic ring system or an aryloxy or heteroaryloxy group, each having 1 to 40 aromatic C atoms, in which one or more H atoms may be replaced by F, Cl, Br or I or which may be substituted by one or more non-aromatic radicals R; a plurality of substituents R here may define a further mono- or polycyclic, aliphatic or aromatic ring system, or an aromatic or heteroaromatic ring system bonded via a divalent group -Z- or an aryloxy or heteroaryloxy group, each having 1 to 40 aromatic C atoms, in which one or more H atoms may be replaced by F, Cl, Br or I or which may be substituted by one or

more non-aromatic radicals R; a plurality of substituents R here may define a further mono- or polycyclic, aliphatic or aromatic ring system;

R^1 is on each occurrence, identically or differently, H or an aliphatic, aromatic or heteroaromatic hydrocarbon radical having 1 to 20 C atoms, in which a plurality of substituents R^1 or R^1 with R may also define a further mono- or polycyclic, aliphatic or aromatic ring system;

Z is on each occurrence, identically or differently, a straight-chain, branched or cyclic, conjugated radical having 1 to 40 C atoms, which is optionally in conjugation with the two other substituents, where the number of atoms in Z which link the group of the formula (1) and the aromatic radical is an even number, where one or more non-adjacent C atoms may be replaced by -O-, -S- or $-NR^1-$ or one or more C atoms may be substituted by a radical R^1 or halogen;

wherein in compounds of the formula (1), a 9,9'-spirobifluorene derivative, a 6,6- and/or 12,12-di- or tetrasubstituted indenofluorene derivative, a tetraarylmethane derivative or a triptycene derivative is present in at least one of the radicals R,

wherein the structure of the formula (1) is pyridazine, pyrazine, or 1,3,5-triazine,

with the proviso that R does not contain substituted or unsubstituted phenylpyridine,

is incorporated between the emission layer and the cathode.

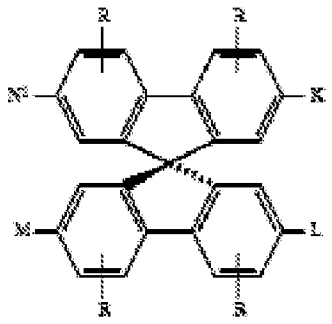
2. A search of the prior art did not show the instant limitations. The closest prior appears to be Oshiyama (US 2003/0198831) in view of Lupo (US 5,840,217).

Oshiyama discloses an organic electroluminescent device (OLED) that contains a light emission layer (emission layer), a hole blocking layer, an anode and a cathode (paragraph 59). The light emission layer contains a host material (matrix material) and a phosphorescent compound (dopant) (abstract). The hole blocking layer can be made of materials that include triazine derivatives (Q is 3) (paragraph 70). The hole blocking layer is located between the light emitting layer and the cathode (paragraph 61).

Oshiyama fails to mention triazine derivative which is a 9,9'-spirobifluorene derivative, a 6,6- and/or 12,12-di- or tetrasubstituted indenofluorene derivative, a tetraarylmethane derivative or a triptycene derivative.

Lupo discloses triazine functional spirobifluorene compounds used in an OLED (abstract). Lupo further discloses that the spiro compounds can be used as charge injection or charge transport for positive (holes) charges and negative (electrons) charges (column 24, lines 35-40).

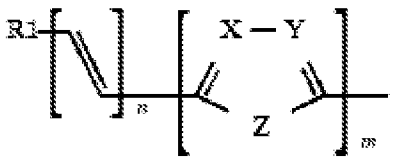
Lupo discloses 9,9'-spirobifluorene compounds represented by Formula L-1



where the symbols and indices have the following meanings:
K, L, M, N are identical or different and are

L-1

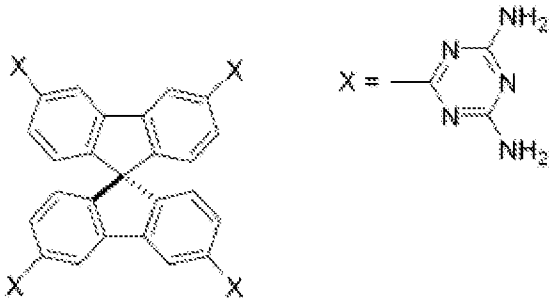
Where M-N-L-K can be represented by formula L-1c (column 2)



and R1 = H, n = 0, m=1, X=N, Y= N, Z is CH=N- which results in a 9,9' spirobifluorene triazine function compound. Formula L-1c is a 1,2,4-triazine. While the above 1,2,4-triazine formula is a positional isomer of a 1,3,5-triazine material applicant has

presented data which shows that the 1,3,5-triazine function as a more effective hole blocking material due to a higher triplet energy level. There would appear to be no reason to modify the 1,2,4-triazine in order to produce a 1,3,5-triazine material.

Additionally, Wuest discloses Formula J-1:



Formula J-1 shows a spirobifluorene core substituted by four 1,3,5-triazine groups. Each triazine is substituted at two CR locations where R is $N(R^1)_2$ and R^1 is represented by hydrogen atoms. Applicant has amended claim 22; CR no longer shows R as $N(R^1)_2$;R now is CR10 that effectively removes NH2 as an option for the substitution of the 1,3,5-triazine ring thus overcoming Wuest.

Additionally, Wuest's Formula J-1 is directed to crystallization promoted by the amino substituents on the triazine rings via hydrogen bonding. Thus, there appears to be no obvious reason to modify the amino groups of Formula J-1 by the replacing of the amino with any of the other groups claimed by applicant as R to arrive at Formulas 1 or 2.

3. Claims 1-4, 7-10, 12-22 and 24-30 allowed.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled “Comments on

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GREGORY CLARK whose telephone number is (571)270-7087. The examiner can normally be reached on M-Th 7:00 AM to 5 PM Alternating Fri 7:30 AM to 4 PM and Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner’s supervisor, Jennifer Chriss can be reached on (571) 272-7783. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. Lawrence Tarazano/
Supervisory Patent Examiner, Art Unit 1781

GREGORY CLARK /GDC/
Examiner
Art Unit 1786